

## CONTRIBUTION TO THE SURGERY OF THE PROSTATE.\*

A. THE RESTORATION OF VOLUNTARY CONTROL OF THE URO-GENITAL SPHINCTER  
IN CASES OF INCONTINENCE OF URINE FOLLOWING OPERATIONS UPON  
THE PROSTATE. B. AN OPERATIVE DEVICE IN THE TREAT-  
MENT OF URETHRO-RECTAL FISTULÆ.

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THE mechanism of the urinary incontinence which occurs sometimes after operations upon the prostate is imperfectly understood. This is very largely the result of ignorance of the physiological mechanism which presides over urination. An examination of the various standard works upon medicine and surgery sheds little light upon this subject, but rather adds to the difficulty, owing to the conflicting statements made therein without adequate explanation.

I question very much whether it is possible from our present knowledge to write a strictly accurate description of the complex physiology of the urinary act. It is certain, however, that much of the confusion which now exists can be removed.

I have endeavored in another place to give as clear a description of the physiology of urination as our knowledge of this complex process permits. I purpose in this paper to present some observations in regard to the cause of certain forms of incontinence of urine and to describe a method of treatment which I have employed for its relief and which I think has not heretofore been suggested.

The class of cases to which I desire to call attention are those in which there is a more or less complete inability to

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retain urine in the bladder owing to partial destruction of the urogenital sphincter, or of its attachments, caused by surgical operation.

During recent years the popularity of prostatectomy in the treatment of obstructive prostatic disease, and the prevailing belief that any surgeon, no matter how limited his experience or knowledge, may perform these operations, has multiplied these cases manifold. I say this advisedly because during the past three years more cases of this kind have been admitted into the service under my charge at Bellevue Hospital than heretofore.

These patients were operated upon in other hospitals, and as a result of the manner in which the operations were performed, their condition was made worse, and ultimately they were transferred to Bellevue Hospital. Many of them according to popular standards could be classed only among the hopelessly incurable.

In some of these cases the obstructing portion of the prostate had been only partially removed, and sufficient obstruction remained to require a second operation for its removal. In other cases the anterior wall of the rectum had been torn and there were at the time of their admission to the hospital large urethrorectal fistulæ. The perineum in these latter cases was little more than scar tissue owing to ineffectual attempts to repair the damage.

In most of these cases there was a more or less constant leakage of urine either into the rectum or through the perineal fistulæ which remained open, or through both. In other cases, although the prostate had been removed, so much damage had been done to the urogenital sphincter that there was more or less constant dribbling of urine through the urethra.

As most of these patients were advanced in years, weakened physically by disease, and by a prolonged convalescence after serious surgical operations, the prospect of any ameliora-

tion of their symptoms seemed remote. The treatment of these cases, however, was undertaken, with a determination to spare no time or pains to accomplish a cure.

We may for convenience divide these cases of incontinence into two classes, viz. :

- a. Those complicated by urethrorectal fistula.
- b. Those not complicated by urethrorectal fistula.

The cause of the urinary incontinence in all of these and similar cases is, I believe, due to more or less destruction of the fibres of the urogenital sphincter muscle, or to a malposition of the attachment of the fibres of parts of this muscle so that they can act only at a disadvantage. The coordinate action and reaction which normally exists between the intrinsic muscle of the bladder and the sphincter is therefore disturbed. It will be found that incontinence of urine occurs most frequently when the roof of the prostatic urethra and with it the arch which the urogenital sphincter forms in front of the canal is damaged. It occurs also more frequently in those individuals who have naturally a more or less atonic muscular mechanism.

The principle of treatment is :

1. To restore when necessary the perineum, the rectal wall and the urethra to a condition as nearly approaching the normal as possible.
2. To teach the individual by exercise, to use what remains to him of the urogenital sphincter muscle, so that he may acquire voluntary control over the retention and expulsion of urine.

When the control of urination by voluntary effort is attained, automatic control will follow as a physiological necessity.

Any atonic or damaged muscle may be made to act, and the power of its action gradually increased by proper exercises.

It is the method of application of these principles of physiology to the act of urination that constitutes the virtue of our treatment.

## THE OPERATIVE TREATMENT OF URETHRORECTAL FISTULÆ.

The closure of urethrorectal fistulæ is looked upon as one of the most uncertain and unsatisfactory of operative procedures. The difficulty of keeping the line of sutures free from infection and of effectively draining the bladder, make a failure of these operations the rule rather than the exception. It is therefore a satisfaction to be able to report that I have so far overcome the difficulties formerly encountered, that I have been able to close these fistulæ permanently by a single operation, and by methods which while they require experience and careful nursing, can be successfully employed by any competent surgeon.

It is necessary in these cases of urethrorectal fistula following prostatectomy to determine first, whether all obstructing portions of the prostate, especially all intravesical projections, have been removed, and whether the bladder is free from calculi. I mention these facts because I have met with cases in which not only was the prostatectomy incomplete, but in which calculi, and in some instances encysted calculi were found in the bladder.

When these conditions are present they should be removed, and the prostatic urethra and vesical orifice should be made even and smooth to the touch before an attempt is made to close the urethrorectal fistula.

To close the fistula the patient is prepared by a few days' purgation with castor oil and the bowel is washed out thoroughly at the time of operation.

With the patient in the lithotomy position a curved incision is made in the perineum in front of the anus, extending from one tuberosity of the ischium to the other; the central portion of the perineum is divided and the dissection is carried upward between the rectum and the prostate so as to expose the wall of the rectum externally for at least  $\frac{1}{2}$  inch above the upper margin of the fistula.

This dissection is to an inexperienced surgeon difficult; for after the prostate has been removed the tissues are very

thin between the rectum and the urethra. It will be found that more space in the perineal wound can be obtained by dividing the origin of the transversus perinei muscles from the ischium, or at least the more superficial part of these muscles.

The edges of the fistula should be separated from the urethra by cutting with a sharp knife and scissors and not by blunt dissection. The edges of the urethra at the seat of the fistula should be carefully refreshed by cutting away all overgrowing mucous membrane from the urethra, but the urethra should not be sutured.

The tissues about the fistulous opening in the rectal wall are then refreshed with curved scissors and made smooth. All hemorrhage should be stopped and the wound made as dry as possible. The opening in the rectal wall is then closed by interrupted Lembert sutures of chromicized catgut placed from the perineal side by means of a round curved needle. These sutures should not include the mucous membrane of the bowel. One suture should be placed well above the upper margin of the opening and one well below the lower margin. It will be found convenient to introduce the sutures from below upward, and not to tie any suture until all have been placed.

After the opening into the rectum has been closed the bladder and bowel are to be irrigated by means of a metal tube. During this process the bowel should not be distended. No drainage tube is put into the bladder.

To protect the line of suture in the rectal wall I have devised the following expedient: A small triangle of gauze consisting of six or eight layers is made to fit the wound. The apex of this triangle is carried by forceps up to and behind the vesical orifice. Between the layers of gauze, a 10 per cent. iodoform ointment, made with vaseline, is then injected from a glass syringe and the little pad is then plastered down so as to fit the posterior surface of the perineal wound accurately.

As the urine flows from the bladder over this pad it is shed off this as water is from a duck's back.

The gauze is to be changed twice or three times a day, or oftener if the pad becomes displaced.

The external wound is then dressed by gauze pads to absorb the urine as it flows out of the wound.

I have usually confined the bowels by the use of opium for one week, and have then given a dose of castor oil and have superintended the giving of an enema at the time of the first movement.

On each day during the first week I introduce into the rectum a metal tube and wash out the lower bowel without distending it, and then inject into the rectum about one or two drachms of iodoform ointment. I am now able uniformly to get solid union of these fistulæ. It requires, however, attention to minute details and good nursing and careful watching. The results are a full compensation for the work.

The perineal wound is given the most careful attention during cicatrization so that it will fill in from the bottom without fistula. Sounds are passed after the first ten days as they may be required to keep the urethra free from stricture and to make its walls smooth.

#### THE RESTORATION OF VOLUNTARY CONTROL OF THE UROGENITAL SPHINCTER.

After restoration of the rectal wall and of the perineum these cases of urinary incontinence come into the second division of our classification and are to be treated as the cases of incontinence not complicated by urethrorectal fistula.

Every surgeon who has had extensive experience in the performance of prostatectomy has encountered these cases, and the occurrence of this disability has frequently been presented as an argument against the operation. Happily the great majority of cases of prostatectomy skilfully done do not suffer from this disability. But there is a sufficiently large number that do so suffer and so far as I know no adequate method of treatment has heretofore been suggested.

The method which I now present has had an extensive

trial during more than three years and the results which have been obtained have justified our most sanguine expectations.

I had the honor to show to the Society of Clinical Surgery at their meeting in New York last October a large number of the cases which form the basis of this paper, and give a practical demonstration of the method of treatment by which these patients had been cured.

This inability to retain the urine as I have said may be more or less complete and I have seen the following different degrees:

1. There may be what is practically if not literally a complete incontinence. The action of the urogenital sphincter seems to be abolished and the urine almost as fast as it flows from the ureters into the bladder, flows out through the urethra, drop by drop. The flow is usually intermittent, and corresponds to the intermittent flow from the ureters.

2. The bladder may be able to retain a small quantity of urine, but when this amount is exceeded there is leakage.

3. The leakage may be intermittent, occurring at certain times during the day. There is often no leakage during sleep, nor for several hours after rising in the morning, but toward evening when the patient becomes physically tired, there is more or less incontinence.

4. The patient may have perfect control while sitting or lying down, but when standing or walking, there is involuntary leakage.

5. There may be leakage immediately after the urinary act, caused by retained urine in the urethra as the result of an atonic condition of the urethral walls.

These different degrees of disability are subject to infinite variation.

The effect of this inability to retain the urine, upon the minds of men naturally feeble, or made feeble by sickness and by disappointment, is often lamentable. And it is very necessary to arouse in the minds of these patients the hope that their disability is not a permanent one. The influence of suggestion here is undoubtedly great, and no time or pains should

be spared to impress them with the reasonableness of a promise to cure them. This is essential, because without the hearty and intelligent coöperation of the individual patient a cure is impossible. On this account and to accomplish the best results, I have adopted the plan of treating several patients together in the hospital; so that those who are beginning to be taught to gain urinary control may be encouraged by those who have been taught, or who are at least further advanced toward a cure than they themselves are.

The method of instruction must vary with each case, but a general idea of the plan pursued in most cases may be given in outline.

The principle of treatment is to make the individual learn by practice to exercise voluntary control over what remains of the urogenital sphincter, thus to prevent the escape of urine. If this can be done, automatic control follows as a physiological necessity.

The difficulties to be overcome are greater than they might at first seem because in some of these cases there has been a very extensive destruction of the urogenital sphincter, by the improper performance of the prostatectomy. Yet even in the seemingly hopeless cases it is surprising to find how readily the parts remaining of this complex muscular mechanism which we call the urogenital sphincter may be trained to compensatory work.

The first step in accomplishing this result is to accustom the individual to moderate bladder distention. A catheter is introduced through the urethra and a warm saline solution is injected. The quantity injected should be just short of that sufficient to excite vesical contraction and a desire to pass urine. The catheter is then closed by the finger and the individual is instructed and urged to exert himself to retain his urine; this is continued for several minutes; then continuing to urge the patient to "hold his water" the catheter is withdrawn. The fluid from this bladder is usually at first expelled, but the patient is urged during the entire time to prevent its escape.



This procedure is repeated several times and with varying quantities of fluid.

After a few days it will be found that the ability to retain some of the fluid injected is acquired. This fact should be pointed out to the patient and he should be encouraged in his efforts. He should be instructed to make voluntary effort to control the escape of urine whenever he can.

After he has acquired the ability to control the injected fluid in the recumbent position, he is taught to control it when moving, when getting out of bed, when sitting down and when performing certain mild calisthenic exercises, as raising first one foot, then the other foot; sitting down and then arising. These actions are at first done with deliberation, then more rapidly.

In order to prevent leakage it is important to see that the urethra is completely emptied after each act of urination. In old men whose muscular structures are relaxed, or in whom the accelerator urinæ muscle has been injured the urethra does not empty itself and the presence of urine in the canal excites the contractility of the bladder and causes dribbling of urine. The patient is instructed to press upon the perineum with the fingers and to strip the urethra after each act of urination.

As soon as he has acquired any voluntary control, he should be instructed to urinate at frequent intervals and each act of urination should consist of an exercise of interrupted urination, viz., to begin the act, to cut off the flow; to begin again, to control the flow.

At first all of these exercises must be done under supervision; and the rapidity with which the results are obtained will depend in a measure upon the intelligence of the individual and his coöperation in the treatment. An ignorant, discouraged, sulky old man is hard to teach; but it can be done if one gives the time and energy necessary.